

THAT WHICH IS CLAIMED:

1. A cellular radiotelephone system comprising:

5 a plurality of time division multiple access (TDMA) cellular radiotelephone base stations, each of which serves a cellular radiotelephone cell and communicates radiotelephone communications with cellular radiotelephones using radiotelephone communications signals communicated over a like plurality of sequential time slots;

10 time-slot synchronizing means for synchronizing said like plurality of sequential time slots among said plurality of base stations, such that a corresponding time slot for each base station is used concurrently, to produce synchronized time slots among said plurality of base stations; and

15 time-reuse partitioning means for allocating cellular radiotelephone frequencies among said plurality of base stations in a first one of said synchronized time slots according to a first frequency allocation system and for allocating cellular radiotelephone frequencies among said plurality of base stations in a second one of said synchronized time slots according to a second frequency allocation system different from said first frequency allocation system.

2. A system according to Claim 1 wherein said first frequency allocation system is one of a first adaptive channel allocation system, a first frequency reuse system, a first frequency reuse partitioning system and a first fixed frequency reuse system, and wherein said second frequency allocation system is one of a second adaptive channel allocation system, a second frequency reuse system, a second frequency reuse partitioning system and a second fixed frequency reuse system.

3. A system according to Claim 1:
wherein said first frequency allocation has a
number of subscribers; and

5 wherein said time-reuse partitioning means
further comprises means responsive to said number of
subscribers of said first frequency allocation system
for allocating cellular radiotelephone frequencies
among said plurality of base stations according to said
first frequency allocation system in a third one of
10 said synchronized time slots.

4. A system according to Claim 1 further
comprising means for receiving a request for a service
type from a cellular radiotelephone and wherein said
time reuse partitioning means comprises means for
5 allocating frequencies responsive to a received request
for a service type.

5 5. A system according to Claim 4 wherein
said service type comprises one of a digital speech
service, a digital data service, a packet data service,
a control message service, a facsimile service, an
image service and a code division multiple access
(CDMA) service.

6. A system according to Claim 1 wherein
said time reuse partitioning means comprises means for
allocating cellular radiotelephone frequencies from a
first frequency pool in a first one of said
5 synchronized time slots and for allocating cellular
radiotelephone frequencies from a second frequency pool
different from said first frequency reuse pool in a
second one of said synchronized time slots.

7. A system according to Claim 6 further
comprising means for receiving a request for a service
type from a cellular radiotelephone served by one of

5 said plurality of base stations and wherein said time
reuse partitioning means assigns said first
synchronized time slot, corresponding to said first
frequency reuse pool, to the cellular radiotelephone
responsive to a request for a first service type and to
10 said second time synchronized time slot, corresponding
to said second frequency reuse pool, to the cellular
radiotelephone responsive to a request for a second
service type.

8. A system according to Claim 7:
wherein said first service type comprises
digital voice service and said second service type
comprises a packet data service; and

5 wherein said first frequency reuse pool
comprises all available frequencies in the cellular
radiotelephone system and said second frequency pool
comprises frequencies unused in adjacent cells.

9. A system according to Claim 7 wherein
said first service type comprises a wideband service
and said second service type comprises a narrowband
service; and

5 wherein said first frequency pool comprises a
plurality of wide frequency bands and said second
frequency pool comprises a plurality of narrow
frequency bands.

10. A system according to Claim 9 wherein
said wideband service comprises a high speed data
service and wherein said narrow service comprises one
of a digital voice service and a low speed digital data
5 service.

11. A system according to Claim 9 wherein
said wideband service comprises a code division
multiple access (CDMA) service.

12. A cellular radiotelephone system comprising:

a plurality of code division multiple access (CDMA) cellular radiotelephone base stations for communicating with cellular radiotelephones on a plurality of frequencies using a plurality of spreading codes, each of said plurality of spreading codes having a period;

5 code synchronizing means for synchronizing said plurality of spreading codes among said plurality of base stations so that said periods of each of said plurality of spreading codes are concurrent, to produce synchronized spreading codes among said plurality of base stations; and

10 code-reuse partitioning means for allocating cellular radiotelephone frequencies among said plurality of base stations for a first one of said synchronized spreading codes according to a first frequency allocation system and for allocating frequencies among said plurality of base stations for a second one of said synchronized spreading codes according to a second frequency allocation system 15 different from said first frequency allocation system.

20 13. A cellular radiotelephone system according to Claim 12 wherein said plurality of spreading codes is one of a plurality of direct-sequence-modulation codes, a plurality of frequency-hopping codes, and a plurality of combined frequency-hopping/direct-sequence-modulation codes.

5 14. A system according to Claim 12 wherein said first frequency allocation system is one of a first adaptive channel allocation system, a first frequency reuse system, a first frequency reuse partitioning system and a first fixed frequency reuse system, and wherein said second frequency allocation

system is one of a second adaptive channel allocation system, a second frequency reuse system, a second frequency reuse partitioning system and a second fixed frequency reuse system.

10 15. A system according to Claim 12:
wherein said first frequency allocation has a
number of subscribers; and
wherein said code-reuse partitioning means
5 further comprises means responsive to said number of
subscribers of said first frequency allocation system
for allocating cellular radiotelephone frequencies
among said plurality of base stations according to said
first frequency allocation system for a third one of
10 said synchronized spreading codes.

16. A method for operating a plurality of
time division multiple access cellular radiotelephone
base stations, each of which communicates with cellular
radiotelephones using a like plurality of sequential
5 time slots, the method comprising:
allocating cellular radiotelephone
frequencies among said plurality of base stations
according to a first frequency allocation system in a
first one of said time slots and according to a second
10 frequency allocation system different from said first
frequency allocation system in a second one of said
time slots.

17. A method according to Claim 16 wherein
said step of allocating is preceded by a step of
synchronizing said like plurality of sequential time
slots among said plurality of base stations, such that
5 a corresponding time slot for each base station is used
concurrently, to produce synchronized time slots among
said plurality of base stations.

18. A method according to Claim 17 wherein
said step of allocating comprises a step of allocating
cellular radiotelephone frequencies among said
plurality of base stations according to one of a first
5 adaptive channel allocation system, a first frequency
reuse system, a first frequency reuse partitioning
system and a first fixed frequency reuse system in said
first one of said synchronized time slots and according
to one of a second adaptive channel allocation
10 system, a second frequency reuse system, a second
frequency reuse partitioning system and a second fixed
frequency reuse system in said second one of said
synchronized time slots.

19. A method according to Claim 17 wherein
said step of allocating further comprises the step of
allocating cellular radiotelephone frequencies among
said plurality of base stations according to said first
5 frequency allocation in a third one of said
synchronized time slots to thereby adapt to increasing
users of said first frequency allocation system.

20. A method for operating a plurality of
code division multiple access cellular radiotelephone
base stations for communicating with cellular
radiotelephones using a plurality of spreading codes
5 each of said spreading codes having a period, the
method comprising the steps of:
allocating cellular radiotelephone
frequencies among said plurality of base stations
according to a first frequency allocation system for a
10 first one of said spreading codes and according to a
second frequency allocation system different from said
first frequency allocation system for a second one of
said spreading codes.

21. A method according to Claim 20 wherein
said step of allocating is preceded by a step of
synchronizing said plurality of spreading codes among
said plurality of base stations so that said periods of
5 said plurality of spreading codes are concurrent, to
produce synchronized spreading codes among said
plurality of base stations.

22. A method according to Claim 20 wherein
said step of allocating comprises a step of allocating
cellular radiotelephone frequencies among said
plurality of base stations according to one of a first
5 adaptive channel allocation system, a first frequency
reuse system, a first frequency reuse partitioning
system and a first fixed frequency reuse system for
said first one of said synchronized spreading codes and
according to one of a one of a second adaptive channel
allocation system, a second frequency reuse system, a
10 second frequency reuse partitioning system and a second
fixed frequency reuse system for said second one of
said synchronized spreading codes.

23. A cellular radiotelephone base station
for a cellular radiotelephone cell which communicates
with cellular radiotelephones using radiotelephone
communications signals communicated over a plurality of
5 sequential time slots using frequencies allocated to
the base station for each time slot of the plurality of
sequential time slots, the base station comprising:
first processing means responsive to a first
type of radiotelephone communications signals
10 communicated during a first group of sequential time
slots of said plurality of sequential time slots, for
processing said first type of radiotelephone
communications signals to thereby recover
radiotelephone communications; and

15 second processing means responsive to a
second type of radiotelephone communications signals
different from said first type of radiotelephone
communications signals and communicated during a second
group of time slots, for processing said second type of
20 radiotelephone communications signals to thereby
recover radiotelephone communications.

24. A base station according to Claim 23:
wherein said first processing means comprises
means for processing narrowband radiotelephone
communications signals; and
5 wherein said second processing means
comprises means for processing wideband communications
signals.

25. A base station according to Claim 24
wherein said means for processing wideband
communications signals comprises means for despreading
code division multiple access (CDMA) radiotelephone
5 communications signals.

26. A base station according to Claim 23:
wherein said first processing means comprises
means for processing digital voice radiotelephone
communications signals; and
5 wherein said second processing means
comprises means for processing packet data
radiotelephone communications signals.

27. A base station according to Claim 26
wherein said means for processing packet data
radiotelephone communications signals comprises means
for canceling interference.

28. A base station according to Claim 23 wherein said first and second processing means comprise:

5 receiving means, responsive to cellular radiotelephones, for receiving radiotelephone communications signals from a cellular radiotelephone over a plurality of signal paths; and
10 means for processing radiotelephone communications signals received by said receiving means.

29. A base station according to Claim 28 wherein said means for processing radiotelephone communications signals comprises:

5 first means for combining the received radiotelephone communications signals which are received from a first direction; and
second means for combining the received radiotelephone communications signals which are received from a second direction.